# Concentrated Stock Diversification Analysis

## Analysis for XYZ Stock

For Professional Investor Use Only

# Barriers to Diversification

- Taxes–capital gain liability will immediately reduce wealth (exacerbated by impact of 2013 rates)
- Emotional attachment–conflicting emotions of attachment versus higher risk
  - Inherited stock
  - Family business
  - Entrepreneur
- Overconfidence–"But my company will outperform!"

  Post-IPO companies tend to return an average of 19% on the first day of trading, but then tend to underperform the market by 2%-3% a year in the following five years*

- Contractual restrictions

*Source: Professor Jay R. Ritter, University of Florida, http://bear.warrington.ufl.edu/ritter/IPOs2011-5years_052012.pdf and http://bear.warrington.ufl.edu/ritter/IPOs2011Statistics042012.pdf

# Sell & Diversify—Taxes, Risk, and Return

- Sell and diversify trade-offs:
  - Pay taxes today (a negative) but gain diversification (a positive)
  - ***Taxes*** reduce immediate wealth—immediate pain
  - ***Risk*** may reduce future wealth—difficult to envision unless you experienced it (e.g., dot com bust)
- Putting it all together—an after-tax Monte Carlo Simulation Framework to model effect of taxes, risk, and liquidation strategies

# Sell & Diversify—Choices

| Choice | Action Year 0 | Action Years 1-5 | Advantages | Disadvantages |
|---|---|---|---|---|
| Keep stock | None | None | • No tax liability | • High risk exposure |
| Liquidate all and invest in ETF | Sell 100%; invest in ETF | None | • Immediate diversification<br>• Lowest fee | • Full tax payment<br>• May violate emotional attachment or regret |
| Liquidate all and invest in loss harvesting SMA | Sell 100%; invest in loss harvesting SMA | Ongoing loss harvesting | • Immediate diversification<br>• Tax advantaged | • Higher tax payment than gradual<br>• May violate emotional attachment or regret |
| Liquidate gradually and invest in loss harvesting SMA | Sell 60%; invest in loss harvesting SMA | Sell remaining stock in equal increments | • Lowest tax liability of sell & diversify<br>• Reflects client's emotional attachment | • Carries some concentrated stock risk until year 5 |

The above is an illustration representative of possible choices and actions that may be taken by a holder of a concentrated stock position. It is not intended to be a specific recommendation or course of action for any particular stock or client.

# Monte Carlo Simulation Assumptions

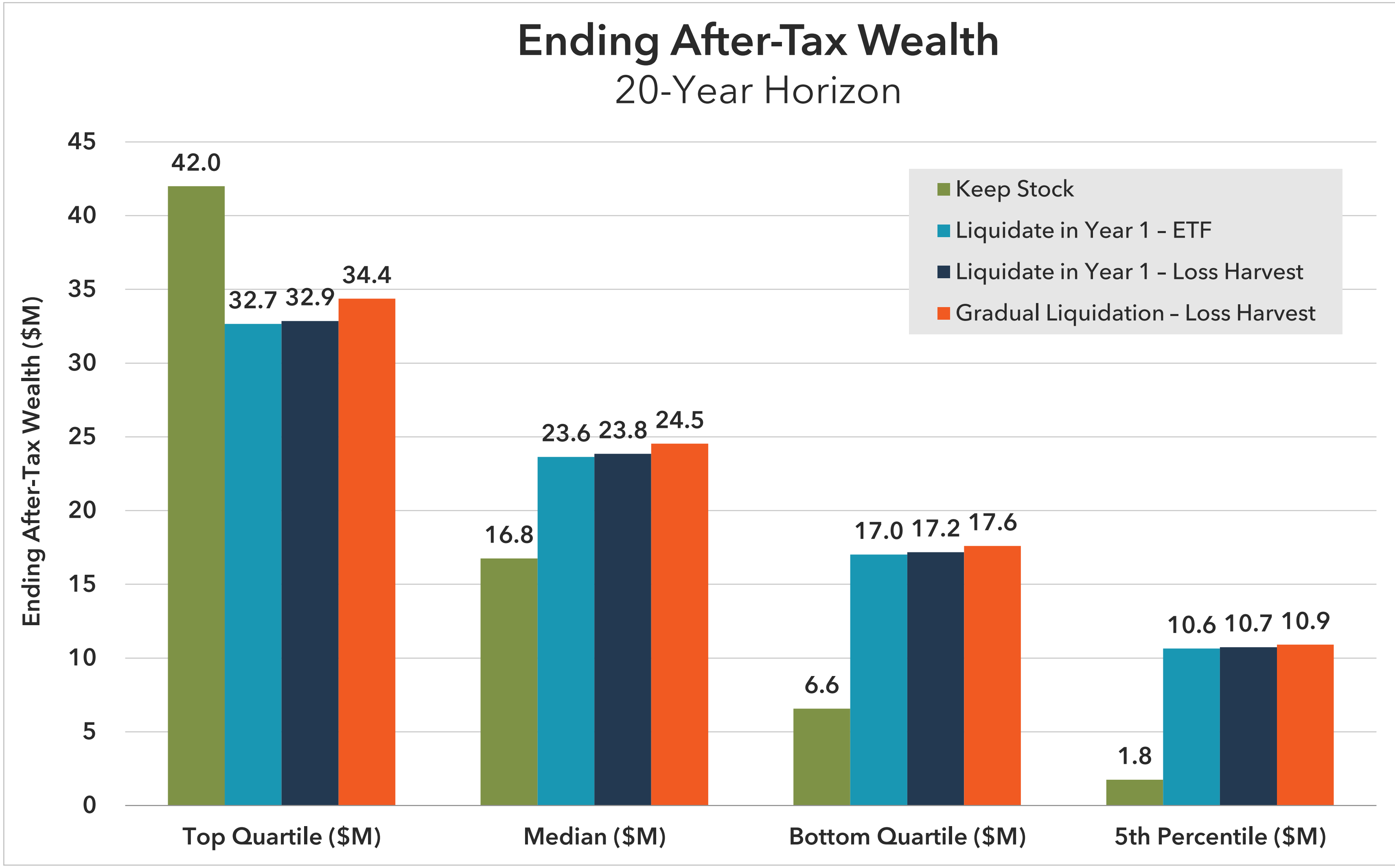
| General Assumptions | |
|---|---|
| Stock | XYZ |
| Starting Diversified Aperio Portfolio | – |
| Starting Stock Value | 10,000,000 |
| Cost Basis | – |
| Tax Rate | 37.10% |
| Potential Tax Paid on Liquidation | 3,710,000 |
| Aperio SMA Fees | 0.35% |
| ETF Fees | 0.10% |
| Market Volatility (Standard Deviation) | 10.56% |
| Market Return | 7.00% |
| Risk-Free Rate | 0.00% |

## Risk and Return Assumptions

| Asset | Beta | Volatility (Std. Dev.) | Correlation with Russell 3000 | Return |
|---|---|---|---|---|
| Stock | 1.05 | 32.79% | 0.34 | 7.35% |
| MSCI ACWI | 1.00 | 10.56% | 1.00 | 7.00% |
| Beta-Adjusted MSCI ACWI | 1.05 | 11.09% | 1.00 | 7.35% |

These return assumptions are for illustrative purposes and not based on actual return experience. See disclosure pages for important information.
Risk and Beta data source: Barra Aegis model risk estimates. Risk is assumed to be constant over the holding period.

# Simulation Results




Results shown are for illustrative purposes only and are based on Monte Carlo analysis using the assumptions previously shown. See disclosure pages for important information .

# Reducing Taxes Using Loss Harvesting

## Taxes paid using different choices (simulation averages)

| | Keep Stock | Liquidate in Year 1 – ETF | Liquidate in Year 1 – Loss Harvest* | Gradual Liquidation – Loss Harvest* |
|---|---|---|---|---|
| Taxes Paid ($) | 0 | 3,710,000 | 3,310,105 | 3,190,679 |
| Tax Savings from loss harvesting ($) | N/A | 0 | 399,895 | 519,321 |

## 20-year ending portfolio values

| | Keep Stock | Liquidate in Year 1 – ETF | Liquidate in Year 1 – Loss Harvest* | Gradual Liquidation – Loss Harvest* |
|---|---|---|---|---|
| Top Quartile ($M) | 41.99 | 32.66 | 32.86 | 34.37 |
| Median ($M) | 16.76 | 23.64 | 23.84 | 24.53 |
| Bottom Quartile ($M) | 6.57 | 17.02 | 17.18 | 17.60 |
| 5th Percentile ($M) | 1.76 | 10.64 | 10.74 | 10.90 |
| % of time strategy wins versus keeping the stock | N/A | **60.56%** | **60.75%** | **62.27%** |

* Tax-Loss Harvesting Assumptions: Liquidation of stock occurs in the beginning of the year. In the gradual liquidation scenario the stock is gradually liquidated over a 5 year period. Tax losses are ONLY used to offset gains from concentrated stock sales. They are not used to offset gains from other parts of the client's portfolio. If there are gains other than from sale of stock, liquidating earlier may be more beneficial to the client. Results shown and for illustrative purposes only and are based on Monte Carlo analysis using the assumptions previously shown. See disclosure pages for important information.

# Gradual Liquidation—Cash Flow Example

## Example Scenario of Gradual Liquidation and Loss Harvesting

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Liquidation – Begin of Year ($) | 6,000,000 | 1,073,500 | 1,152,402 | 1,237,104 | 1,328,031 |
| Stock Remaining ($) | 4,000,000 | 3,220,500 | 2,304,805 | 1,237,104 | – |
| Example Portfolio ($) | 6,000,000 | 5,507,437 | 6,773,005 | 8,177,665 | 9,766,744 |
| Est. Aperio Losses Harvested ($) | (646,730) | (339,389) | (326,113) | (397,782) | (451,392) |
| Gain From Sale of Stock ($) | 6,000,000 | 1,073,500 | 1,152,402 | 1,237,104 | 1,328,031 |
| Net Gain ($) | 5,353,270 | 734,111 | 826,290 | 839,322 | 876,639 |
| Taxes Paid ($) | 1,986,063 | 272,355 | 306,553 | 311,388 | 325,233 |
| Taxes Saved ($) | 239,937 | 125,913 | 120,988 | 147,577 | 167,466 |
| End of Year Portfolio Value ($) | 8,727,937 | 9,077,809 | 9,414,769 | 9,766,744 | 10,125,183 |

Example is for illustrative purposes and does not represent actual cash flow of a gradual liquidation and loss harvesting strategy.

# Behavioral Finance

- Two possible future unhappy outcomes

| Action Now | Stock Soars | Stock Dives |
|---|---|---|
| Diversify | Regret at lost opportunity* | Relief at having diversified |
| Hold Stock | Joy at riding updraft | Regret at not having diversified* |

* But you can always blame your financial advisor in either case.

- Imagine and compare both negative outcomes
- Assess probability of each
- Understand that human focus on suffering is so much stronger than elation

# Disclosure

The information contained within this presentation was carefully compiled from sources Aperio believes to be reliable, but we cannot guarantee accuracy. We provide this information with the understanding that we are not engaged in rendering legal, accounting, or tax services. In particular, none of the examples should be considered advice tailored to the needs of any specific investor. We recommend that all investors seek out the services of competent professionals in any of the aforementioned areas.

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Monte Carlo simulations shown reflect randomly generated outcomes based on historical statistical parameters as disclosed on the slides. Such simulations show probability of different outcomes rather than predicting a particular outcome. Results may be worse than shown in simulations. Forecasted return for the concentrated stock and the index are calculated using the risk-free rate the equity return premium and beta. (Return = Risk-free rate + Beta × Equity Return Premium.) Standard deviation is a statistical measure of the dispersion of a set of data from its mean. Standard deviation is calculated as the square root of variance. It is often used as a measure of the risk associated with price fluctuations of a given asset or the risk of a portfolio of assets. The higher the standard deviation of an investment's returns, the greater the relative riskiness because of uncertainty in the amount of return.

The performance ranges shown for both the Stock and the Benchmark Index are estimates based on historical and forecast statistics. Actual results could be significantly different from those shown, including cases where an investors return will be worse. Actual implementation of investing a portfolio to track the Benchmark Index would incur fees, either for an ETF or a separately managed account, which would lower the returns shown.